THURSDAY, SEPTEMBER 24, 1914.

## SPECIALISED GEOLOGY.

(1) *Structural Geology.* By C. K. Leith. Pp. viii + 169. (London: Constable and Co., Ltd.) Price 6*s.* 6*d.* net.

(2) *Geologischer Führer durch Nordwest-Sachsen.* By E. Krenkel. Pp. vii + 202 + 14 plates. (Berlin: Gebrüder Borntraeger, 1914.) Price 4 marks.

(3) *Australasian Fossils. A Students' Manual of Palaeontology.* By F. Chapman. With an introduction by Prof. E. W. Skeats. Pp. 341. (Melbourne and London: G. Robertson and Co. Propy., Ltd., 1914.)

(4) *Practical Instructions in the Search for, and the Determination of, the Useful Minerals, including the Rare Ores.* By A. McLeod. Pp. ix + 114. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1914.) Price 5*s.* 6*d.* net.

(1) MR. LEITH'S book does not cover so wide a field as Prof. James Geikie's "Structural and Field Geology," which was reviewed in this journal in 1912 (vol. xc., p. 159), nor is it so attractive at first reading as Prof. Wilckens's "Grundzüge der tektonischen Geologie" (NATURE, vol. xcii., p. 564). But it represents the application of close thinking to the problems of earth-fracture and the displacement of rock-masses in regard to one another, and it forms a specialised manual for the student of all kinds of rock-flow. The large amount of sliding and differential movement that takes place between layers of the same contorted series may be well realised in the field; but it is not apparent in our ordinary diagrams. Mr. Leith, on p. 114 and elsewhere, very usefully directs attention to it, and connects the "drag-folds" seen on a small scale with the overfolded structure of the Alps. Willis's terms, "competent" and "incompetent," which are too familiar in their ordinary usage, are adopted (p. 111) for layers of rock that respectively resist and yield to compound crumpling. A fold may exhibit "competence" up to a certain point, and may become "incompetent" on continuance of pressure, yielding in this case as a series of folds in which the successive beds are similarly curved. The book is full of matter that leads to accurate realisation, and includes useful reviews of such widely separated terminals of the subject as the origin of joints and the theory of isostasy.

(2) In his description of North-west Saxony, Dr. E. Krenkel has the advantage of dealing with a district that includes a palæozoic range folded in Middle Carboniferous times, a conspicuous development of Permian strata with associated volcanic rocks, Oligocene and Miocene brown coals, and boulder-clay in which Scandinavian granite (rappakiwi) has been found. The combination is a happy one for those who study geology at Leipzig, though there is a large gap in the stratigraphical succession. The glacial and fluvioglacial deposits contain the mammoth, *Rhinoceros mercki,* and the reindeer. Ice-scratched surfaces are noted at several points, and the dry epoch at the close of the last ice-age has left its traces in the form of grooves etched by wind-borne sand on the porphyry cliffs of the Klein Berg (p. 91). The contact-metamorphism due to granite of Carboniferous age is studied in the last of the excursions, and the question is left open as to whether the associated gneisses are a marginal type of the granite, or an older mass into which the latter has intruded (p. 180).

(3) The early association of Mr. F. Chapman, now of the National Museum, Melbourne, with the detailed researches of Prof. Rupert Jones gave promise of the accurate contributions that he has made to Australian palæontology. It is an admirable sign of the times that Great Britain is no longer the field to which problems of the southern hemisphere must be referred. The publication of an introduction to the study of fossils in which Australian examples are primarily employed cannot fail to stimulate observation, and such absorbing details as the "Collyweston Slate" and the "Oldhaven Beds" may in time drop out of view in examination papers set for our antipodes. At the same time, the author will be the first to recognise that notable gaps in the record must be filled in by reference to other lands. The Triassic cephalopods and almost all fossil mammalia serve as notable examples, and a "students' manual of palæontology" may be expected to lay a broader foundation than is here given. Mr. Chapman's book, however, is justified by its principal title, and it will be of immense help to workers in Europe who require a ready reference to species recognised on the other side of the equator. The bibliographies following each chapter still further deserve our gratitude.

(4) Mr. McLeod's book is bound for the pocket, and contains useful hints for the prospector, who is shown how to perform a number of tests with ingenious and simple apparatus. It is, however, taken for granted that he will not be interested in the reactions involved. The chemical composition of minerals is loosely stated, and a mixed list of minerals and chemical oxides on p. 81 is styled a list of "ores." The mouth-blowpipe is not relied on; yet it would reduce cassiterite in

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a tenth of the time occupied by the method given on p. 37, while a candle is often easier to deal with in experiments requiring heat than the "brisk wood fire" advocated on p. 23. We should like a prospector to take up this practical little book after an elementary course in mineralogy; but this seems too much to ask of those whose energy and observation may affect the fortunes of huge companies. G. A. J. C.

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## *INSECTS AND DISEASE.*

*A Text-book of Medical Entomology.* By Dr. W. S. Patton and Dr. F. W. Cragg. Pp. xxxiv+768+lxxxix plates. (London and Madras: The Christian Literature Society for India, 1913.) Price 15.12 rupees, or *1l. 1s.*

THE vast literature which has sprung up in connection with medical entomology gives some indication of the importance of this comparatively new subject, and the work under review is the first attempt at a text-book. The subject chiefly concerns those medical and veterinary officers practising in the tropics, frequently out of the reach of current literature, and this book is designed to give to these men a concise introduction to entomology in so far as it is connected with medicine.

The book is divided into twelve chapters, and of these the first four, occupying rather more than half the volume, deal with flies. The blood-sucking and other noxious types of these insects are dealt with very fully, and chapter ii., which is entitled "Anatomy and Physiology of the Blood-sucking Diptera," is perhaps the best in the book. The different types of "biting" flies are discussed as to general structure and internal anatomy, and the question of the origin of the mouth-parts of the "biting" from the "non-biting" Muscidæ is made an excuse for bringing in an excellent description of the mouth-parts of the house-fly.

Chapters v. to x. deal with fleas, bugs, lice, ticks, mites, and the pentastomids or 'tongue worms," the latter two groups, although not insects, being usually regarded as coming within the meaning of the term "entomology."

The book is well illustrated, there being eighty-nine plates, the majority of the figures being original sketches by the wife of one of the authors, and many of these indicate a large amount of careful dissection.

There are a few mistakes, such as that in bugs the "mandibles are so opposed as to form a channel with a circular lumen, while the maxillæ are armed with cutting teeth" (p. 6), and there are occasionally definite statements made upon debatable points, as with regard to the number of segments composing the insect head (pp. 9 and 13); but the chief complaint we have to make is against the way the book has been edited. There are, for instance, some sentences which are either difficult to understand or altogether unintelligible. Thus, on p. 7 we read, "In the Diptera . . . the sucking tube is formed by the outgrowth from the pharynx of two spatulate slips, one dorsal and the other ventral," and it is not until p. 21 that we find the real meaning of this extraordinary statement, where it is said, "In the Diptera [the adaptation of the mouth for sucking] is accomplished by the development to a very high degree of just those parts of the mouth apparatus which are rudimentary in the cockroach, namely, the epipharynx and the hypopharynx. These are outgrowths from the dorsal and ventral walls respectively of the stomodæum. . . ."

On p. 15 is the cryptic statement: "When the head [of a fly] is viewed from behind the whole of the posterior wall is seen to be chitinous, while at the lower border there is a rounded foramen between the anterior and posterior surfaces through which the proboscis is protruded."

Again, in various places we find references to earlier passages which it is almost impossible to trace. Thus, on p. 130, "The relations of the hæmatocœle of the proboscis of the fly have been described at some length in connection with the mechanism of the mouth-parts." But there is no section entitled "Mechanism of the mouth-parts"! There is a heading "Mechanism of the proboscis," but the required statement is not there, and it is only from three words in one sentence that one gets a hint, and we ultimately find what we want under "Movements of the Labella" in connection with a description of the proboscis of Musca (p. 46).

One other complaint we make with regard to the difficulty of using the book. In a number of cases there is much lettering on the plates, and there is the greatest difficulty in finding the explanatory pages. There is a page of reference letters to cover plates i. to vii. immediately following plate i. and just before plate viii. is a page to cover plates viii. to xiii, but there is nothing on any of the plates to indicate where the explanatory pages are to be found. Unfortunately also the page of reference letters for plates i. to vii. is almost wholly wrong.

There are thus many faults in the book, and they are the more to be regretted since much of the material is really first-class. It can only be hoped that the work will run to a second edition in which these defects can be remedied.

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